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PROBLEMS OF THE COAL INDUSTRY IN 1960

Following is a translation of an article by Mining Engineer G. V. Krasnikovskiy in the Russian-language periodical Ugol' (Coal), Moscow, No. 4, 1960, pages 3-8.

In carrying out the grandiose program for the development of the building of communism adopted by the Twenty-First Congress of the CPSU, Kommunisticheskaya Partiya Sovetskago Sosoyuza-Communist Party of the Soviet Union, the Soviet people achieved new outstanding progress in 1959, the first year of the Seven-Year Period, in the development of the productive forces of the nation and in the strengthening of the socialistic economy.

The workers of the coal industry marked the first year of the Seven-Year Plan with great successes in their work. The annual plan for coal production was fulfilled ahead of schedule and the national economy received an additional 4 million tons of coal above the plan. Last year more than 500 million tons of coal were mined in our country, which made it possible fully to satisfy the coal needs of the national economy.

The rapid tempo of the development of the national economy requires further increase in fuel resources.

In recognizing the vital economic importance of the manpower and material outlays in the fuel-producing branches of industry, the Communist Party and the Soviet Government have adopted a course which calls for emphasizing the development of the most economical fuels - oil and natural gas and increasing their share in the fuel balance of the nation.

The revision of the structure of the fuel balance and the acceleration of the tempo of the increase in labor productivity connected with this revision have placed the mission of meeting the requirements of the national economy with the best and cheapest coal before the coal industry. This problem can be solved only through a steady increase in labor productivity and reducing the costs of producing coal through carrying out a great program for the overall mechanization and automation of the laborious processes in coal enterprises, through the introduction of advanced techniques and technology, and through improvement of the organization of production and labor.

The more efficient distribution of the enterprises of the coal industry, and the exploitation of economically effective deposits which will ensure the application of progressive methods for producing coal, has helped raise the level of technological-economic indexes.

Successful fulfillment of the 1960 plan will constitute a significant stage in the development and technological improvement of the coal industry.

Inspired by the historic decisions of the Twenty-First Congress of the CPSU and also the June and December (1959) Plenums of the Central Committee of the CPSU, the workers of the coal industry, along with all the workers of our Motherland, have joined with great enthusiasm in socialistic competition for the pre-term fulfillment of the plan for the second year of the Seven-Year Plan.

Increased socialistic obligations have been undertaken by the miners of the Stalinsk, Lugansk, Karaganda, Kemerovo, and a number of other economic and administrative regions. The results of the work done in the first months of 1960 provide evidence that these obligations are being fulfilled successfully.

What then, should be the chief, decisive trend in the development of the coal industry in the current year?

Further improvement of the structure of the extraction and distribution of coal enterprises will be one of the basic conditions for a sharp improvement in the performance of the coal industry. Taking into consideration the growing demand for fuel in the eastern regions of the nation and the presence of large deposits of high-grade and relatively cheap coal in these regions, the 1960 plan calls for the primary development of coal production in the Kuznetsk, Karaganda, and Kansk-Achinsk Basins.

In the mean time, plans for the European part of the Soviet Union and the Urals call for some reduction or maintenance on the former level of production of costly Moscow Regional, the poor Donets, Bashkir, and other steam power coal, which is to be replaced by cheaper forms of fuel--mazut oil and natural gas.

Fully meeting the growing requirements of ferrous metallurgy for coking coal is one of the most important problems of the coal industry. In accordance with this, the plan for 1960 provides for emphasizing, still further, the development of coking coal production. Although the coal industry as a whole is to increase the extraction of coal by 1.7 per cent over the 1959 level, 7 per cent more coking coal should be produced this year than was produced last year, including a 22 per cent increase in the Karaganda Basin, a 14.5 per cent increase in the Pechora Basin, and a 7 per cent increase in the Donets Basin.

The assignments in respect to the increased production of coking coal during the current year are very exacting and their fulfillment will require a great deal of organizational and operational work in the coal basins in order to improve the performance of existing enterprises and to ensure the timely commissioning of new coal mines and open-pit mines. The latter factor is of great significance since plans call for obtaining 18 per cent of the entire increase in coking coal production in the Donets Basin and about 50 percent of this increase in the Karaganda Basin through commissioning new mines.

It will be necessary to carry out further measures in 1960 for increasing the mechanized handling of coal, its cleaning and sorting. The plan calls for cleaning 8.4 per cent more coal in the coal cleaning plants than in 1959.

Along with this increase in the schedules for existing enterprises, new cleaning plants with a capacity of 21.2 million tons are to be commissioned this year which is 4.7 times the capacity commissioned in 1959.⁷ Commissioning new coal cleaning plants is to double in the RSFSR and increase almost one and one-half times in the Ukrainian SSR.

The grades of coal used for generating electric power are to be markedly improved in 1960. In spite of the sufficient quantity of coal now delivered to consumers, its quality does not adequately meet the conditions of rational use, which leads to large losses of fuel in the national economy. This is especially true of the supply of high-grade coal for the domestic needs of the population.

A great deal of work was done in 1959 to decrease the pulverizing of anthracite during extraction and transportation, and also to improve sorting, which made it possible to increase the output of large and medium sizes of coal.

The effective work done by the Rostov National Economic Council (SOVNARKHOZ) should be mentioned in particular in regard to this important problem. As a result of the execution of a number of measures for bringing order into drilling and blasting work, reducing the number of loading points, replacing scraper conveyors with belt conveyors, installing additional screening machines in the coal-sorting sheds, etc, the mines of the ROSTOVUGOL (Rostov Coal) Combine increased their output of large and medium size anthracite in 1959 by more than 1 million tons, or almost 13.5 per cent, over the 1959 level.

Along with this, it is also necessary to point out the insufficient work done to improve the grading of coal produced in the mines of the Stalinsk National Economic Council, where the output of sorted coal in 1959 had increased only 4 percent over the 1958 figure.

During the current year the output of large and medium grades of coal should increase by 8 per cent, including 14 percent in the Donets Basin. This will oblige the managers of the coal enterprises (particularly in the Donets Basin) to increase the amount of processing and sorting as well as the output of large and medium grades of coal.

Additional resources of coking coal should be obtained through an increase in the production of coal briquettes. In 1960, 19 per cent more briquettes are to be produced than in 1959, and 24.5 per cent more in the Ukrainian SSR. Briquette production should be introduced in small-scale facilities by briquetting dust and screenings with abundant petroleum binding agents, along with increased production of briquettes in briquette factories.

Constant improvement of techniques and the technology for extracting coal is of decisive significance in improving the performance of mines, open-pit mines, and coal cleaning plants.

There are still many shortcomings in the development of technological progress in the coal industry which retard the increase in labor productivity and the decrease in production costs. For example, the chief shortcoming of mechanization of technological processes in coal mines is that this mechanization is not overall mechanization. As a result, laborious work in timbering, roofing, and moving conveyors, is done by hand in production workings in along with wholly mechanized cutting and breaking. A large number of workers are engaged in manual labor during preparatory work, in underground transportation, and also on the surface, particularly in auxiliary work.

Automation of mining processes is being introduced slowly and only in individual places and operations, a condition which does not yield the necessary economic effect.

Scientific research, planning and designing work to produce new types of machines and equipment for the coal industry are still on an inadequate scale and do not ensure the necessary tempo of the development of overall mechanization and automation of the processes for producing coal. Much time is required for designing new mining machinery, a condition which markedly retards the introduction of new technology in the mines.

Many of the types of machinery used do not come up to the modern level of technology and have short service lives and low operation reliability. However, the machinery building plants continue to manufacture obsolete equipment and take little interest in modernizing it.

Along with this, the machines and equipment are used unsatisfactorily; in a number of coal basins the percentage of machines in operation has declined in recent years, and their productivity has scarcely increased.

The Plenum of the Central Committee of the CPSU held in June 1959 worked out very important measures for the practical implementation of the historic resolutions of the Twenty-First Party Congress in the field of further technological progress in all branches of the national economy.

In accordance with the resolutions of the June Plenum of the Central Committee of the CPSU, the plan for the development of the national economy of the USSR for 1960 calls for the execution of vital measures for the mechanization, automation, and the introduction of advanced technology in the coal industry and for the designing and mastery of the production of new machines, machinery, and equipment.

The work which was begun for the first time in 1949 - 1950 on mechanizing the most laborious and the heaviest process in coal production -- loading coal on conveyors, was markedly improved in 1960. This, the amount of mechanized coal loading in the drifts of gently sloping or pitching coal seams was set at 146 million tons for the entire coal industry of the USSR, that is, almost 12 percent more than

the actual amount of loading in 1959. More than half the coal extracted (in those cases in which loading was required) was to be loaded on conveyors by mechanized means.

The transition to overall mechanization of coal production in cleared coal faces in gently sloping or pitching seams will be extended further in 1960. Another 200 rooms are to be converted to complex mechanization during the year.

The amounts and levels of mechanized loading of coal and rock during preparatory work are to be markedly increased by expanding the introduction of drifting combines.

In accordance with the instructions of the June Plenum of the Central Committee of the CPSU, a number of machines of obsolete design are to be taken out of production and new, very important machines and machinery are to be developed and manufactured. Of the new units and machines which the coal industry is to receive in 1960, one should mention the M-9D complex of machinery equipped with LDG-2 combines and A-2 and A-3 coal extracting units and the UMK complex of machinery, and the MK-1 multicombine, narrow-bucket complex. This equipment has been designed for the overall mechanization of coal-extracting processes in cleared coal faces in gently sloping seams of various thicknesses.

The Mosbass mechanized and shielded timbering machine was successfully introduced in the Mosco Basin. The use of this machine permitted the mechanization, for the first time in the coal industry, of timbering and roof support at the coal faces. The average daily production of coal at the coal faces was increased about 2.2 times and the movement of the cleared lines of faces 1.7 times; moreover, the production costs were markedly reduced.

By the end of 1959, the Mosbass timbering machine was in use in 25 coal faces. Its use will be markedly extended during the current year. Work has begun on introducing these shielded timbering machines together with coal cutting combines in cleared coal faces, which will ensure the overall mechanization of all processes for extracting coal.

In order to mechanize tunneling work, the KShKh machinery complex will be manufactured to ensure the opening of wide drifts in gently sloping coal seams and the KS-2ts machinery complex for sinking mine shafts with a drilling and blasting method.

Plans have been made to introduce KLTs-1 belt and chain conveyors and KPI-1 flexible plate conveyors with a capacity of 250 tons per hour and lengths up to 1000 meters to haul coal along slopes with gradients up to 12-14 degrees.

Serious attention should be given to designing and manufacturing necessary quantities of apparatus for the automatic control of machinery and technological processes.

A great deal of work is to be done in 1960 on automatizing laborious processes. Up to the present time, as mentioned previously, only individual stationary facilities have been automatized in the coal mines. Automatized underground loading points have been introduced; remote and automatic control of conveyor lines and endless cable hauling

are being introduced in inclined workings; remote and automatic control of all machinery for changing mine cars have been applied in rooms near shafts for skip and cage hoisting; practical procedures and apparatus have been tested in practice for automatizing hoisting facilities with skips and car dumping cages for shallow shafts (to 300 meters); equipment which has been designed to automatize the exchange and hauling of mine cars in buildings above the shafts, has found extensive use in the Donbass mines; and plans have been worked out for automatic control of loading coal from bunkers into railroad cars.

Individual procedures and means have been introduced experimentally for automatic and remote control of technological processes in coal cleaning plants -- measuring amounts when unloading bunkers, regulating the coal drying process, and centralized lubrication of machines and machinery.

The accumulated practical experience and the improved procedures which have been developed for automatizing individual production processes and facilities make it possible to go on, in short periods of time, to overall mechanization and automation of processes at the surface and underground transportation as well as in technological processes in coal cleaning plants.

1960 should be a turning point in this respect. By the end of the year, technological processes should be fully mechanized and automatized in 31 mines and in 7 coal cleaning plants, including 10 mines and 5 coal cleaning plants in the RSFSR and 21 mines and one coal cleaning plant in the Ukrainian SSR.

The effectiveness of the conversion of mines and coal cleaning plants to overall mechanization and automation of production processes can be judged by the following examples.

The implementation of the plan for overall mechanization and automation of the Chertinskaya-Yuzhnaya Mine (Kuzbass) is to result in freeing 400 persons from heavy manual labor, or 29 per cent of all the workers of the mine, and ensure an increase in labor productivity of 57 per cent for the mine. The savings will amount to 9.6 million rubles yearly and the capital outlays connected with introduction of mechanization and automation will be repaid in a little more than 2 years.

Conversion to overall mechanization and automation of the technological processes in the operational Coal Cleaning Plant No 3 in the Kuzbass will permit yearly savings of about 880,000 rubles and the outlays for automation will be repaid in 3.5 years.

A great deal of attention should be devoted to improving the quality and the development of coal cleaning in the plans for the introduction of advanced technology in the coal industry during 1960. The extensive introduction of a method for processing coal in heavy media is one of the principal technical trends in the field of mechanization of separating rock and cleaning coal. The application of this method will make it possible to clean coal in sizes up to 300 - 500

millimeters and larger, to increase the output of clean coal, to eliminate hand picking of coal, and to ensure the complete automation of the technological process of coal cleaning. This effective method is to be introduced in 21 mines and 2 coal cleaning plants in 1960.

Mechanization and automation of the technological processes in mines and coal cleaning plants and the gradual conversion to overall mechanization and automation of the enterprises obliges scientific research and planning and designing institutes to expand their work in this direction and proceed in all ways to facilitate this program for the technical re-equipping of the coal industry.

Along with the solution of the problems of overall mechanization and automation of production processes, special attention should be directed to searching out new, very effective systems for extracting coal without the constant presence of people by the cleared coal faces and also to improving the procedures for finding and preparing mine fields which will ensure the elimination of multistage underground hauling, bringing order into mining practice in the mines, and marked increase in production in cleared coal faces and in the coal seams.

The most effective open-pit and hydraulic methods for extracting coal will be further developed in 1960.

More than 103 million tons of coal should be taken from open-pit strip mines, which is about 20 per cent of the entire national output. The plan calls for more than a 10 per cent increase over the 1959 level in the amount of stripping and excavation work to be done by high-production methods which make use of powerful excavators. The extensive use of high-production rotary excavators is to be combined with the use of powerful belt conveyors. Excavators with increased cutting power will make it possible to obtain selective removal of coal seams and extract 4,000 to 5,000 tons of coal a day. At present, two such excavators are being completed in the plants of the Karaganda National Economic Council and the National Economic Council of the Uzbek SSR and will be put into operation this year.

The commissioning of high-production KRU-900 conveyors equipped with belts reinforced with steel cables in the Korkino Open-Pit Mines of the Sverdlovsk National Economic Council in 1960 will also be new items in the technique of continuous operation in open-strip mines.

The industrial introduction of a little-used hydraulic method for extracting coal has been started in recent years. Numerous planning projects and practical work experience in a number of enterprises in the Kuzbass and the Donbass have provided convincing proof of the high technical and economic effectiveness of this progressive method for extracting coal.

In the interests of attaching great importance to the operation of the mines, and reducing laboriousness and improving the working conditions in the coal industry, special measures were worked out in 1959 to define the basic trends in the development of hydraulic extraction of coal in our country in the next seven years.

Plans have been made to extract up to 3 million tons of coal by hydraulic means this year, that is, almost triple the amount obtained in that manner in 1959.

It must be stated that there are now many difficulties in the development of hydraulic extraction. Certain technical problems are still not completely solved; in particular, sufficiently improved procedures and methods for drying coal have not been developed as yet; also, the designs of modern types of centrifuges, high-pressure pumps, feeders, and other equipment for hydraulic mines have not been completely developed.

However, the further development of hydraulic extraction of coal depends, to a large extent, on the attitude of the managers of the trusts, combines and national economic councils toward this most important work.

Thus, for example, a great deal of attention has been devoted to the development of hydraulic sections with an annual capacity of 1.2 million tons were commissioned in a short period of time during 1959 -- an amount which exceeds the capacity of the sections commissioned in the Kuzbass during the last seven years. The essential equipment for hydraulic mines is being manufactured in the plants of this national economic council.

At the same time, this progressive technology is spreading at an intolerably slow rate in the Kuzbass, the origin of the industrial introduction of hydraulic mining. Practically nothing was done last year in the Kuzbass basin to increase the amount of coal mined by the hydraulic method. This is all the more difficult to understand because All-Union Scientific Research and Planning and Designing Institute for Hydraulic Coal Mining, which is charged with developing and introducing the technology of hydraulic extraction and transportation of coal, is located in the Kuzbass.

The organizations which open mines, which are obligated to commission new capacity on schedule, and also the plants which supply the technological equipment for hydraulic mines, bear a large amount of responsibility for the fulfillment of the assignments established for 1960.

New hydraulic mines and sections are to be put into operation. The first block of the large Yanovskiy Hydraulic Mine is to be put into operation in Lugansk (Voroshilovgrad) Oblast.

The intensification of work on production and preparatory coal faces by the widespread introduction of cyclic organization of production, is an essential condition for the effective use of modern mining techniques, increasing labor productivity, and reducing the production costs.

Practice in the Donbass mines in 1959 showed convincingly, once again, that cyclic work done in accordance with a schedule, is one of the most progressive methods for organizing the production process.

As a result of the conversion of the majority of the drifts in the mines of Lugansk National Economic Council to work on a cyclic schedule, the average monthly advance of the line of production coal faces was increased by 16 per cent in 1959, and the labor productivity of the workers in the production workings grew by 7 per cent.

At the same time, not enough attention was devoted to the problems of cyclic organization of production in the Kuznetsk, Karaganda, and a number of other coal basins. Thus, for example, only 26 per cent of the drifts in the Karaganda mines were on cyclic schedules in December 1959: the advance of the lines of production coal faces had declined 3.3 per cent below the 1958 level; while the labor productivity of the workers in the production workings decreased by almost 8 per cent.

The task consists in ensuring the introduction of cyclic organization of work in 1960 throughout all the principal coal basins and widely disseminating the great amount of favorable experience accumulated in the Donbass in this matter.

It is also necessary to complete the conversion of all mines to a broken work schedule, with a common day of rest, in 1960. This is particularly applicable to the Donets and Karaganda Basins where a number of mines are continuing to work on an unbroken work week. It is also necessary to develop preparations for a gradual conversion of mines to mining coal on two shifts, thus eliminating night shifts, which will do much to improve the working conditions of the miners.

A great deal of work is being done to improve the working conditions of the miners and to improve their safety in the enterprises of the coal industry. A number of measures have been carried out in recent years in the struggle with coal and rock dust. Drilling with spraying and dry dust removal have been introduced successfully, measures are being carried out in respect to warnings of danger of explosions of methane and coal dust as well as in ensuring the safe operation of electrical equipment and bringing order into blasting work.

It will be essential this year, to develop work still further in respect to improving safety engineering and improving the working conditions of the miners. It will be necessary to work persistently to achieve the compliance of all enterprises with measures designed to improve the status of safety engineering and to facilitate, in all ways, the introduction of progressive methods of work, new machines and machinery which will make possible the improvement of the working conditions of the workers. Special attention should be devoted toward reducing occupational diseases among miners, intensifying measures for combatting sudden explosions of coal and gas, and introducing organizational and technical measures which will improve working safety.

Further development and the radical improvement of the coal industry depend, to a large extent, on the successful work of mine-opening organizations and the elimination of delays in the opening and reconstruction of mines, open pits, and coal cleaning plants.

There were large shortcomings in the work of the mine-opening organizations last year. The plan for commissioning coal mines and open pit mines was only 87 per cent fulfilled and only 58 per cent fulfilled in the Karaganda Basin. A large lag was also permitted in the construction of coal cleaning plants. Less than half the new coal cleaning facilities specified by the plan were actually commissioned during the year.

In spite of the high tempos of tunnelling accomplished in some mines, the average monthly rates of driving crosscuts, drifts, and other horizontal workings increased very little during 1959.

Mine-opening organizations are faced with serious problems in 1960, when 1.5 times more new coal mines and open-pit mines are to be commissioned than in 1959. Particularly heavy assignments in respect to the commissioning of new facilities have been established in Donets, Kuznets, and Karaganda Basins where it will be necessary to commission a number of new mines for producing coking coal. Thus, for example, the capacity commissioned in 1959 by 2.2 times, and in the Kuzbass by 1.8 times.

In the Karaganda Basin, it will be necessary, first of all, to eliminate the lag in the construction of new mines in the Churubay-Nura and the Tentek Coal Deposits, which are to supply the Karaganda Metallurgical Plant with coking coal.

In order to ensure further improvement of the quality of the coal delivered to consumers, in the first instance coking coal, it will be necessary to do a great amount of work on the construction of coal cleaning plants.

Successful fulfillment of the assignments in respect to the construction and the commissioning of coal enterprises will require the concentration of the necessary material resources and manpower on the construction projects which are near completion and which are the most important and the timely delivery of planning and estimate documentation to the objects under construction.

In this connection, it is necessary to point out that there are still serious shortcomings in the work of the planning organizations. The plans used in opening mines are inadequate and cumbersome; the structural elements of the buildings on the ground surface above the mines are not sufficiently standardized a condition which hampers the introduction of industrial methods of construction; the established schedules for issuing technical documentation are often violated and thereby retard the normal course of construction.

The organization of mine tunnelling and construction work should be improved during the current year on the construction sites, and in the mine-opening trusts and combines; also main tunnelling and construction machinery and equipment should be more fully used.

Carrying out the great program in 1960 for technical progress in the coal industry and for improvement of technology of the processes of coal production and the organization of production and labor actually amount to the task of reducing the labor-consuming nature of these processes, increasing labor productivity, and decreasing the production costs of coal.

It is necessary that the problems of fulfilling the tasks of improving the technical and economic indexes of operation should constantly be the center of attention in every mine, open-pit mine, and coal cleaning plant.

Carrying out the plan for the second year of the Seven-Year Period will permit, along with a further growth in coal production, a significant improvement in the performance of the coal industry and betterment of the working conditions of the miners, which is, itself, a major problem of the coal industry in 1960.

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